VIA FACSIMILE
703-872-9319

9D-HR- 19209
PATENT

IN THE SPECIFICATION

Please amend paragraph 26 as follows.

Processor 32 controls all devices receiving power from power supply 14. To test the electrical functionality of fan motor 12, processor 32 switches off all electrical loads on power supply 14. After all loads are shed from power supply 14, processor 32 switches PNP transistor 22 to an off state allowing a measurable voltage drop across sense resistor 26 whenever current flows from node 20 to node 24. PWM circuit 34 then energizes motor 12 using a duty cycle of 100 percent (PWM signal is kept high). Processor 32 then measures respective analog voltages from lines 16 and 18 and determines power consumption by sense resistor 26, in accordance with the following relationship:

$$\frac{[(Upper\_A/D\_Reading)-(Lower\_A/D\_Reading)]^2}{Rsense}$$

where *Upper_A/D_Reading* is the supply voltage measured from line 16, *Lower_A/D_Reading* is the motor load voltage measured from line 18, and *Rsense*~~*Rsence*~~ is a resistance in ohms of sense resistor 26. *Rsense*~~*Rsence*~~, in one embodiment, is selected to produce current values of between about 1 mA and about 100 mA through resistor 26. Processor 32 also provides for switching from motor functionality diagnosis to closed loop control. For example, after diagnosing that the motor functionality is within a predetermined operating range, i.e., that the motor is energized and not locked, processor 32 switches PNP transistor 22 to an on state and controls motor 12 as explained above.

Please amend paragraph 31 as follows.

Figure 3 is a representation of a monotonically increasing waveform 70. Waveform 70 includes a first wave 72, a second wave 74, a third wave 76, a fourth wave 78, a fifth wave 80, and a sixth wave 82. Each wave [[70,]] 72, 74, 76, 78, 80, and 82 has a substantially similar period 84 and includes a leading edge 86, a high portion 88, a trailing edge 90, and a low portion 92. High portion 88 of first wave 72 is approximately 40% of period 84. High portion 88 of second wave 74 is approximately 45% of period 84. High portion 88 of third wave 76 is approximately 50% of period 84. High portion 88 of fourth wave 78 is approximately 55% of period 84. High portion 88 of fifth wave 80 is approximately 60% of period 84. High portion 88 of sixth wave 82 is approximately 40% of period 84. High portions 88 vary from 40% to 60% and average 50%, which is the duty cycle. Specifically, high portions 88 vary from a low value of approximately 10 percent below the average (50%) and monotonically increase to a high value of approximately 10 percent above the average forming a sweep action before returning to the low value and sweeping again. The average is the duty cycle. In an alternative embodiment, the high value is approximately 20% above the average and the low value is approximately 20% below the average. In another embodiment, the high and low values are approximately 5% above and below the average respectively. In yet another embodiment, the high and low values are more than 20% above and below the average respectively. In a further embodiment, the high and low values are less than 5% above and below the average respectively.

Please amend paragraph 35 as follows.

Figure 4 is a cross-sectional view of closed-loop PWM controlled motor 12 (shown in Figure 1) including a housing 102, a stator assembly 104, a rotor assembly 106, and a commutator assembly 108. Stator assembly 104 is located within housing 102 and includes a stator core 110 including a stator bore 112 for receiving rotor assembly 106. Stator core 110 further includes a plurality of wound field poles 114. Rotor assembly 106 includes rotor shaft

116 carrying commutator assembly 108 and an armature core 118. Commutator assembly 108 includes a plurality of commutator bars 120 and a brush holder 122 including a plurality of brushes (not shown). Commutator assembly [[86]]108 further includes a plurality of insulator segments (not shown) arranged alternately with commutator bars 120 in a circumferential direction of rotor shaft 116. In an alternative embodiment, motor 12 is an electronic DC motor and does not include commutator assembly 108. Motor 12 is electrically connected to processor 32 and PWM control sub-circuit 34 as shown in Figure 1.